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The impact of purchasing strategy-structure (mis)fit on purchasing cost and innovation performance

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ABSTRACT

The organizational design literature strongly supports the notion of "structure follows strategy", and suggests that a misfit between the two has a negative effect on performance. Building on this line of argument, we examine to what extent the (mis)fit between purchasing strategy and purchasing structure impacts purchasing performance. We focus on cost and innovation purchase category strategies, and examine how the deviation from an ideal purchasing structure defined along three dimensions (centralization, formalization, and cross-functionality) impacts purchasing performance. Analysing data collected from 469 firms in ten countries, we demonstrate that a strategy-structure misfit negatively impacts purchasing performance in both cost and innovation strategies. We also find that purchasing proficiency is a mediator in this relationship between misfit and performance. Our findings aid managerial decision making by empirically validating the necessity of having the right purchasing structure for successfully executing different purchasing strategies.

1. Introduction

Although the purchasing function, like any other business function, can adopt a variety of strategies (Krause et al., 2001), two main strategic objectives stand out: cost and innovation (Blome et al., 2013; Carey et al., 2011). The importance of the purchasing function in generating cost savings and increasing efficiencies for organizations is well-documented (Ellram, 1995; Trent and Monczka, 1998; Zsidisin et al., 2003). In addition to this traditional focus on cost, the purchasing function's role in contributing to innovation has become quite prominent in the past decade, both in practice as well as in research (Baier et al., 2008; Blome et al., 2013; Schiele, 2010; Wynstra et al., 2003).

Whether or not these strategies translate into functional and business performance depends on several factors. Some studies have investigated the performance effect of alignment; i.e. the extent to which purchasing strategies are aligned with other functional strategies and business strategies (Baier et al., 2008; González-Benito, 2007; Narasimhan and Das, 2001). When there is a greater fit between purchasing strategies and business strategies, firms achieve higher performance (Baier et al., 2008; González-Benito, 2007).

Another factor that may significantly impact performance is the fit between purchasing strategy and the organizational structure within the purchasing function (Schneider and Wallenburg, 2013), but so far only a few studies investigated this link between purchasing strategy and purchasing structure. Among those, Tate and Ellram (2012) examine how a services offshore outsourcing strategy leads to adaptations in purchasing structure, and Trautmann et al. (2009) examine the different types of purchasing structures that are more likely to be implemented when pursuing a global sourcing strategy. Both studies increase our understanding about the link between purchasing strategy and structure, but further insights can be gained by investigating other types of purchasing strategies (than offshoring and global sourcing) and by specifically adopting a "fit" perspective to examine this phenomenon.

There have been several studies in the strategy literature that build on the contingency notion of "structure follows strategy" (Chandler, 1962), and examine the fit between strategy and structure, and the effect of (mis)fit on firm performance (Galunic and Eisenhardt, 1994; Miller, 1987; Porter, 1985). The common finding of those studies is that the organizational design characteristics of a firm should match the firm's strategy in order to achieve sustainable superior performance (Burns and Stalker, 1961; Govindarajan, 1986; Wasserman, 2008). Translating this line of argument to the purchasing context, one would argue that organizational design characteristics of purchasing need to be in line with the purchasing strategy to have high purchasing performance, and deviations from this ideal situation would result in lower purchasing performance. Currently, however, there is a lack of empirical evidence about this claim. In response to this gap, the

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objective of this study is to examine the impact of the (mis)fit between purchasing strategy and purchasing structure on purchasing performance. In doing so, we aim to contribute to the literature in three ways.

First of all, we investigate purchasing structure in a holistic way by considering its multiple dimensions. Research on organizational design in purchasing has been dominated by the centralization-decentralization debate (Trautmann et al., 2009). However, there are several other organizational design dimensions, in particular formalization and cross-functionality (Burns and Stalker, 1961; Damanpour, 1991; Tate and Ellram, 2012; Trautmann et al., 2009). Although there have been some studies that investigate formalization and cross-functionality in purchasing individually (e.g. Cousins et al., 2006a; Moses and Åhlström, 2008; Trent and Monczka, 1994), these dimensions of purchasing structure have seldom been examined as part of an overarching purchasing structure concept, and they have not been studied in relation to specific purchasing strategies. In this study, we therefore examine the relationship between purchasing strategy and three elements of purchasing structure: centralization, formalization, and cross-functionality.

Second, we examine purchasing strategy and purchasing structure at the level of the purchase category. Studies examining purchasing organization design mostly focus on the overall purchasing function level (e.g. David et al., 2002; Foerstl et al., 2013; Johnson et al., 2002; Rozemeijer et al., 2003). However, recent research acknowledges that purchasing structure is defined at a more specific level where firms have different purchasing structures for their various purchase categories managed with different purchasing strategies (Karjalainen, 2011; Trautmann et al., 2009). Increasingly, organizations adopt more hybrid structures, which can for instance accommodate varying degrees of centralization. In that context, it is of crucial importance to distinguish between organizational structure requirements for different types of purchase categories (Trautmann et al., 2009).

Third, we not only test whether a (mis)fit between strategy and structure results in (lower) higher purchasing performance, but we also aim to shed light on the mechanism for this effect. Specifically, we investigate the mediating role of purchasing proficiency on the relationship between strategy-structure misfit and purchasing performance. Purchasing proficiency can be defined as the quality of managing the purchasing processes due to the advancement of skills and knowledge (Feisel et al., 2011; Millson and Wilemon, 2002). In line with what has been termed the 'extended contingency model', namely the strategy-structure-process-performance link (Rodrigues et al., 2004; Zheng et al., 2010), we argue that a (mis)fit between purchasing strategy and structure (negatively) positively impacts purchasing proficiency, thereby resulting in (lower) higher purchasing performance.

The remainder of the paper is structured as follows. In the Literature Review section we first briefly discuss two key types of purchasing strategies defined in terms of strategic objectives: cost and innovation. Then, we elaborate on how purchasing structure is examined at the functional and purchase category level, and subsequently discuss how purchasing strategy relates to purchasing structure. We complete the literature review by discussing the mediating role of purchasing proficiency. In the Research Design section, we explain our data collection and sample characteristics, measurement, and various checks for biases. After that, we present our findings in the Results section. Finally, the Discussion section elaborates on the most intriguing findings, reviews the theoretical and managerial implications, and discusses research limitations and suggestions for future research.

2. Literature review

2.1. Purchasing strategies

The organizational strategy process typically consists of two steps: 'strategy formulation' which relates to the strategic intent/strategic objectives, and 'strategy implementation' which consists of the practices and actions taken to implement the objectives defined in the strategy formulation step (Ginsberg and Venkatraman, 1985).

The majority of studies on purchasing strategy focus on the implementation part where specific purchasing practices and actions are examined as elements of purchasing strategies (González-Benito, 2010). For instance, purchasing strategies are defined by Burke et al. (2007) as single versus multiple sourcing, by Trent and Monczka (2005) as local versus global sourcing approaches, and by Birou et al. (1998) as a bundle of purchasing practices such as cost reduction, value analysis, supply base reduction, supplier development, and benchmarking. Interestingly, strategic objectives have been examined to a lesser extent in defining purchasing strategies. For instance, Watts et al. (1995) argue that manufacturing and purchasing strategies need to be aligned, and define purchasing strategies based on competitive priorities, such as cost, quality, delivery, and flexibility. Similarly, González-Benito (2010) define purchasing strategy as a profile of generic competitive objectives, not as a set of practices deployed by the purchasing function. In order to understand why specific purchasing practices are implemented in the first place, one should look at one step back, and examine the purchasing objectives.

Cost management and cost reduction are traditionally argued to be the most prevalent objectives in purchasing (Carter and Narasimhan, 1996; Zsidisin et al., 2003). This is not surprising considering that the purchased goods and services, components, and systems constitute the majority of the total cost of goods sold in various industries (Dubois and Pedersen, 2002; Van Weele, 2010). In addition to this traditional role, cost management in purchasing also has a strategic role nowadays due to the growing amounts of outsourcing and global sourcing (Trautmann et al., 2009; Zsidisin et al., 2003). Therefore, a *Cost Strategy*, where the focus is on decreasing the unit prices of purchased items, reducing total cost of ownership, improving efficiency, and increasing asset utilization (David et al., 2002; Narasimhan and Das, 2001; Zsidisin et al., 2003), is considered as one key purchasing strategy.

With the increased understanding of the strategic role that purchasing functions can play in contributing to competitive advantage (Carr and Pearson, 2002; Cousins et al., 2006b), firms started to add more value-adding activities to their purchasing agenda such as supplier involvement in innovation (Carr and Pearson, 2002; Narasimhan and Das, 2001; Wynstra et al., 2003). Instead of relying on only internal research and development (R & D) capabilities, many firms approach their suppliers to get more innovative components and production/process technologies (Schiele, 2006; Walter et al., 2003), and actively involve them in joint new product development (NPD) projects (Handfield et al., 1999; Jean et al., 2012; Schiele, 2006). As the purchasing function has first-hand knowledge about suppliers and is responsible for managing relationships with suppliers, the necessity of translating innovation strategies into purchasing strategies is obvious. In line with this, firms pursue an *Innovation Strategy* in their purchasing function when they aim to improve the introduction rates and timing of new products and services as well as achieve improvements in quality, specifications and functionality (Baier et al., 2008; Primo and Amundson, 2002).

Although we acknowledge that there can be other purchasing objectives such as flexibility, delivery, and sustainability (González-Benito, 2007; Luzzini et al., 2012; Watts et al., 1995), usually cost and innovation are considered the most important ones (Baier et al., 2008; David et al., 2002; Terpend et al., 2011), and in a similar vein, regarded as crucial purchasing performance outcomes. Recently, Carey et al. (2011) investigated the impact of social capital in buyer-supplier relationships on purchasing performance by focusing on buying firm's cost and innovation improvement. Similarly, Blome et al. (2013) also argue that cost and innovation performance in purchasing are the two most important outcomes for contractual and relational governance of suppliers.

While firms may have purchasing strategies at the overall function level, they also have purchasing strategies at a lower level of aggrega-

tion; at the purchase category level (Luzzini et al., 2012; Terpend et al., 2011; Trautmann et al., 2009). A purchase category is defined as a homogenous set of products and services that are purchased from the same supply market and have similar product and spend characteristics (Luzzini et al., 2012; Van Weele, 2010). Firms have many different types of purchases ranging from office supplies to critical raw materials, and the purchasing objectives change across categories (Cousins et al., 2008; Luzzini et al., 2012; Van Weele, 2010). For instance, while firms can focus on a cost strategy for office supplies or raw materials with low supply risk, they may rather pursue an innovation strategy for components with key functionalities for their final customers.

Before discussing the link between purchasing strategy and purchasing structure, in the next section we first discuss the purchasing structure concept both at the organizational and at the purchase category level.

2.2. Purchasing structure

Organization structure can be considered as consisting of many different dimensions, but the three most prominent dimensions discussed in both the organization and innovation literatures are centralization, formalization, and cross-functionality (Aiken and Hage, 1971; Damanpour, 1991; Miller et al., 1988). *Centralization* is defined as the degree to which decision making authority and power are concentrated at the top as opposed to delegating these to lower level management (Olson et al., 2005, p. 51). *Formalization* is defined as the degree to which an organization emphasizes following rules and procedures (Damanpour, 1991, p. 589). Finally, *cross-functionality* is defined as the gathering of people from different functions of an organization for effective delivery of a common organizational objective (Holland et al., 2000, p. 233).

Past research mostly adopted a fragmented approach where the effects of structure variables on purchasing performance have been examined individually (Trautmann et al., 2009). For instance, Rozemeijer et al. (2003) investigate the factors that impact the choice of centralized versus decentralized purchasing organizations, and Moses and Åhlström (2008) examine problems in cross-functional sourcing decision processes. Foerstl et al. (2013) compare the effects of centralization ("functional coordination") and cross-functional integration on purchasing performance at the firm level. Thus, there is still a need for a more holistic approach where multiple dimensions of the purchasing structure are analysed (Schiele, 2010), and in relation to purchasing strategies – thereby enabling an assessment of the implications of the fit between strategy and structure.

Additionally, the focus in investigating purchasing structure has mostly been on the organizational level. In practice however, organizations use different purchasing structures for different purchase categories. For instance, Karjalainen (2011) suggests that organizations, at the overall level, usually adopt hybrid structures and that within this overall structure, centralization differs across purchase categories. Similarly, Trautmann et al. (2009) find that due to differences in information processing needs required to manage different purchase category strategies, there is a need for different purchasing structures with matching information processing capacities. To investigate how an offshore outsourcing strategy impacts service supply management structure expressed in centralization, formalization, and complexity, Tate and Ellram (2012) also observe and analyse such structural dimensions at the level of the purchase category (i.e., the service that is outsourced).

2.3. The link between purchasing strategy and structure

To gain a comprehensive understanding about organizational strategies, strategy formulation and strategy implementation need to be examined separately, yet in relation to each other (Ginsberg and Venkatraman, 1985). After firms formulate their strategies and decide which objectives to emphasize, they focus on the elements that impact the successful implementation of these strategies (Olson et al., 2005). Among these implementation dimensions, one of the most germane is organization structure.

Various studies in the organization literature highlight the importance of having an organizational design that enables the chosen strategy and thereby results in superior performance outcomes (Chandler, 1962; Miller, 1987; Porter, 1985). This view conveys that it is neither the strategy nor the structure that has a direct impact on performance, but instead the internal alignment between the two (Wasserman, 2008). The fit between strategy and structure creates internal efficiencies whereas its absence hinders successful strategy implementation. The main underlying reason behind the detrimental performance effect of a misfit between strategy and structure is the mismatch between the information processing needs induced by a strategy and the information processing capabilities provided by a structure (David et al., 2002; Galbraith, 1973; Tushman and Nadler, 1978).

Burns and Stalker (1961) view organizational structure dimensions in combination, and distinguish between two types of organizational structures: mechanistic versus organic organizations. Organic structures are characterized by low levels of centralization and formalization and high levels of cross-functionality, and are argued to be more suitable for innovation strategies, whereas mechanistic structures are characterized by high levels of centralization and formalization and low levels of cross-functionality, and are found to be more effective to implement cost strategies.

A centralized structure is often argued to be associated with economies of scale, efficiency, and low coordination costs, and therefore is found to be more suitable for cost strategies. On the other hand, centralization can narrow communication channels and decrease the incentives for the organization members in seeking innovative ideas (Damanpour, 1991), whereas decentralization provides an environment with more flexibility and speed required to manage higher coordination requirements (David et al., 2002). Therefore, in executing innovation strategies, where there is more ambiguity and the need for more information processing capability to manage coordination, decentralized structures are argued to bring superior performance (Burns and Stalker, 1961; Damanpour, 1991).

Purchasing centralization can be defined as the degree to which purchase decision authority, responsibility, and power are concentrated to a few people and often at higher levels (Johnston and Bonoma, 1981; Lewin and Donthu, 2005). Few studies investigating purchasing structure (albeit at the organizational level) seem to support the argument that a centralized structure is better for a cost strategy. David et al. (2002) and Baier et al. (2008) find that for implementing cost strategies a centralized purchasing structure – which is associated more with consistency, simplicity, and higher logistic efficiency – is more suitable. Similarly, Karjalainen (2011) states that with a centralized purchasing structure firms are better off in obtaining lower prices.

Formalization and routines allow standardizing routine activities efficiently (Tate and Ellram, 2012); however, increased reliance on rules and procedures hampers experimentation and a unit's variation-seeking behaviour (Jansen et al., 2006). On the contrary, low emphasis on formalization facilitates innovation through encouraging new ideas and actions (Burns and Stalker, 1961; Damanpour, 1991). Consequently, high levels of formalization are found to be more effective for cost strategies and low formalization for innovation strategies.

In this research, we define *purchasing formalization* as the degree of formal rules and procedures used in different purchasing processes in the purchasing function (Johnston and Bonoma, 1981; Lewin and Donthu, 2005). David et al. (2002) argue that in order to successfully implement differentiation strategies with innovation objective, having a purchasing structure that relies less on rigid rules and procedures is required due to increased governances needs requiring more responsiveness, whereas to implement a cost strategy a formalized purchasing

structure emphasizing keeping costs at a minimum and budget controls is much more beneficial.

Finally, an innovation strategy can be argued to function better when there is rapid cross-functional communication among the organization members which will help in creating distinct products and services (Burns and Stalker, 1961; Damanpour, 1991). On the other hand, the higher information processing capacity provided by cross-functional structures can result in higher coordination costs and thus be less suited for cost strategies.

Purchasing cross-functionality can be defined as the extent to which purchasing personnel interact with personnel from other departments (Atuahene-Gima, 1995; Moses and Åhlström, 2008). There are some studies stressing the cross-functional nature of the NPD projects that usually require many departments of the firm to work together such as purchasing, manufacturing, engineering and R & D (Das et al., 2006). Van Echtelt et al. (2008) propose that cross-functional integration between purchasing and R & D is an important enabling factor in NPD activities. One of the main advantages with cross-functional teams is the possibility to continuously interact and increase knowledge in the team, which is argued to result in more innovations (Moses and Åhlström, 2008).

Combining the above arguments from the organization and purchasing literatures, we arrive at the following two hypotheses:

Hypothesis 1:. *In the case of a purchase category with a cost strategy, the higher the deviation from the ideal purchasing structure for that strategy (high centralization, high formalization, low cross-functionality), the lower the purchasing cost performance will be.*

Hypothesis 2:. *In the case of a purchase category with an innovation strategy, the higher the deviation from the ideal purchasing structure for that strategy (low centralization, low formalization, high cross-functionality), the lower the purchasing innovation performance will be.*

2.4. Purchasing proficiency as the mediator

Next to organizational structure, another important strategy implementation dimension is argued to be the operational processes (Galbraith and Nathanson, 1978; Miles et al., 1978). The extended contingency view proposes that the link between strategy and structure is followed by the processes, which in the end impact performance (Rodrigues et al., 2004; Xu et al., 2006; Zheng et al., 2010). The underlying argument behind this view is that the benefits of a structural fit can only be achieved if this fit can be translated into processes and practices that have a direct impact on organizational performance (Xu et al., 2006). Therefore, the processes, or the quality of executing the processes, can be considered as a mediator between the strategy-structure fit and performance. In other words, processes constitute the mechanism through which the beneficial (detrimental) impact of (mis)fit is actually exerted on performance.

Organizational buying consists of several processes, and researchers often define four to ten key purchasing processes (e.g. Kotteaku et al., 1995; Monczka, 2005; Van Weele, 2010). Amongst the most widely known classifications is the one offered by Van Weele (2010) who defines three tactical purchasing processes (specification, supplier selection, contract agreement) and three operational purchasing processes (ordering, expediting, and evaluation). In addition to tactical and operational purchasing processes, with the increasingly strategic role of purchasing, firms are also engaged in several strategic purchasing processes such as supplier development and supplier involvement in new product development (Handfield et al., 1999; Monczka, 2005; Van Weele, 2010). When there is a misfit between purchasing strategy and purchasing structure, the quality of executing all purchasing processes decrease.

Higher levels of strategy-structure fit facilitate the effective implementation of business processes (Vorhies and Morgan, 2003). Performance differentials can only be the result of how processes are executed (Stoelhorst and Van Raaij, 2004), not of structures or strategies per se. For instance, structures that are congruent with strategy enable the type of information processing that is needed to attain high performance (Wolf and Egelhoff, 2002). A higher strategy-structure fit creates the conditions for strategic, tactical, and operational purchasing processes with higher levels of proficiency. These highly proficient processes positively impact both cost and innovation purchasing performance. A similar relationship has been examined in the NPD context where Millson and Wilemon (2002) defined NPD process proficiency as how well the NPD stages and the tasks of an NPD process are performed, and empirically tested its link with organizational integration (organizational design) and new product success (performance). Whether purchasing process proficiency also acts as a mediator between strategy-structure (mis)fit and performance remains unsearched, however. In order to examine this, we propose the following hypotheses:

Hypothesis 3:. *In the case of a cost strategy, purchasing proficiency mediates the relationship between the deviation from the ideal purchasing structure (for that strategy) and purchasing cost performance.*

Hypothesis 4:. *In the case of an innovation strategy, purchasing proficiency mediates the relationship between the deviation from the ideal purchasing structure (for that strategy) and purchasing innovation performance.*

3. Research design

3.1. Data collection and sample

To test our hypotheses we used data from the International Purchasing Survey (IPS) project. IPS is executed by a group of researchers from Europe and North America, and is an online survey that examines business strategies, purchasing strategies and practices at the functional and purchase category level, and their effects on purchasing and firm performance (Karjalainen and Salmi, 2013; Luzzini et al., 2012, 2015). We took various steps in the IPS project to improve construct and measurement equivalence of responses between countries (Bensaou et al., 1999; Hult et al., 2008). For instance, in order to improve face validity we relied on recently advocated approaches for survey development such as using balanced statements in the questions and avoiding a neutral middle category in scale options where possible (Saris and Gallhofer, 2007). After the survey was developed, we assured translation equivalence by using the TRAPD (Translation, Review, Adjudication, Pre-testing, and Documentation) procedure (Harkness et al., 2003), and pre-tested the survey with target informants in each country. We relied on centrally established guidelines on sampling design requiring a minimum size of companies and certain ISIC codes (Lynn et al., 2007). In addition to these pre-data collection measures to assure equivalence, we also tested for measurement equivalence post-data collection, which is discussed in detail in the following sections. For further details of reliability and validity of IPS, please refer to Karjalainen and Salmi (2013), Knoppen et al. (2015), Luzzini et al. (2012) and Luzzini et al. (2015).

The data collection took place in ten countries in Europe and North America in 2009. In total data from 681 companies were gathered by means of an online survey with an overall response rate of 9.5%, which is comparable to most recent studies adopting such online and/or complex survey tools (e.g. Carey et al., 2011; Kristal et al., 2010; Wu et al., 2012). The first part of the survey focused on company-level questions, whereas in the second part informants were specifically asked to choose one purchase category that they are knowledgeable about. For the current analysis, we only retain those companies that have a corporate structure, and divisions or business units with multi-level purchasing functions, as otherwise it would be impossible to have

Table 1
Sample characteristics.

Countries	Frequency	%	Number of employees	Frequency	%
Canada	23	4.9%	< 100	67	14.3%
Finland	30	6.4%	100–249	88	18.8%
France	52	11.1%	250–999	118	25.2%
Germany	43	9.2%	1000–5000	97	20.7%
Italy	42	9.0%	> 5000	83	17.7%
Netherlands	39	8.3%	Not indicated	16	3.4%
Spain	36	7.7%	*Total*	*469*	
Sweden	97	20.7%			
United Kingdom	66	14.1%	**Informant titles**	**Frequency**	**%**
United States	41	8.7%	Chief Procurement Officer	65	13.9%
Total	*469*		Purchasing director	94	20.0%
			Purchasing manager	220	46.9%
Industries	**Frequency**	**%**	Senior buyer, project buyer	36	7.7%
Manufacturing	286	61.0%	Buyer, purchasing agent	26	5.5%
Service	178	38.0%	Other	27	5.8%
Not indicated	5	1.1%	Not indicated	1	0.2%
Total	*469*		*Total*	*469*	

any variation in the level of centralization at the category level. This leaves 469 companies in our final dataset. Table 1 illustrates the sample characteristics. All of our informants were from the purchasing function and 81% of them were purchasing managers or above with an average of 13.8 years of experience. Manufacturing firms constituted 61% of the sample, but service firms were also well-represented. There was also a good spread over various firm sizes.

3.2. Measurement

The unit of analysis in this study is the purchase category. We define a purchase category as a homogenous set of products and services that are purchased from the same supply market and have similar product and spend characteristics (Cousins et al., 2008; Luzzini et al., 2012; Van Weele, 2010). All of our constructs are measured at the purchase category level.

We list all the questions and measures used in this study in Appendix A. We measured both types of strategies and related performance by adopting items from Blome et al. (2013), González-Benito (2007), Carey et al. (2011), and Krause et al. (2001). Common dimensions (objectives) for cost strategy in these articles were: reducing (total) product and process costs, reducing prices, and improving utilization (inventory, labour), whereas common dimensions (objectives) for innovation strategy were: improving introduction rates of new products by suppliers, improving cycle time (time-to market) of new products by suppliers, and also improving quality and functionality of products. We asked the informants to indicate the extent to which management has emphasized the cost and innovation objectives for the chosen purchase category on a 6-point scale, ranging from “not at all” to “completely”. Considering the difficulty of obtaining objective performance data, especially at the purchase category level, we asked the informants to rate their purchase category performance as compared to their targets on a 7-point scale, ranging from “much worse than target” to “much better than target”.

We identified which purchase categories are managed with a cost or an innovation strategy by calculating the relative emphasis. This approach is similar to the one used by Craighead et al. (2009). If the informants gave higher scores for cost objectives than innovation objectives, these purchase categories were classified as being managed for cost strategies, and vice versa. We discarded 61 purchase categories where there was an exactly equal emphasis on both objectives as the theory does not suggest an ideal structure for such combined strategies. This resulted in a final sample of 253 purchase categories managed with a cost strategy and 155 purchase categories managed with an innovation strategy.

In order to operationalize purchasing structure dimensions (centralization, formalization, and cross-functionality) and purchasing proficiency at the purchase category level, we developed new scales. As the core of our argument is that within one and the same organization, different purchase categories may be organized in different ways, it would not be appropriate to measure purchasing structure at the level of the entire organization (corporation or similar). The best way to assess how the organizational purchasing structure is applied at the category level is by investigating the purchasing processes, as these form the key mechanism through which the structure is enacted for a specific category. Based on Monczka (2005) and Van Weele (2010), we defined a comprehensive list of nine strategic, operational, and tactical processes: supply market analysis, spend analysis, sourcing strategy development, supplier selection and contracting, supplier development, management of the order cycle, supplier involvement into new product development, supplier integration in order fulfilment, and supplier evaluation.

Informants were first asked to indicate which of the nine purchasing processes, listed above, were executed and thus relevant, and then we measured centralization, formalization, cross-functionality, and purchasing proficiency in each of these processes by adopting the definitions from Dawes et al. (1998), Johnston and Bonoma (1981), Lau et al. (1999), and Millson and Wilemon (2002). On average, informants deemed 8.1 (out of 9) purchasing processes relevant, and in 95% of the cases, organizational structure and purchasing proficiency were measured for seven or more relevant purchasing processes. There is little difference in the relevant purchasing processes between the two strategies. In the instances where a cost strategy was applied, on average 8.0 purchasing processes were deemed relevant, and in the instances where an innovation strategy was applied, on average 8.1 purchasing processes were deemed relevant. At the level of the individual purchasing processes, the differences between cost and innovation strategies were also limited: the share of instances where a purchasing process was deemed relevant varied 5% at most across the two strategies (see Table 2).

We operationalized purchasing structure variables and purchasing proficiency as formative constructs. Reflective measurement requires that the indicators used to measure a construct are caused by the latent construct they describe, and are therefore highly correlated and in principle interchangeable (Diamantopoulos and Winklhofer, 2001; Jarvis et al., 2003). However, formative measurement means that the indicators in combination form the latent construct. The indicators can be very different from each other and do not necessarily correlate (Diamantopoulos and Siguaw, 2006; Diamantopoulos and Winklhofer, 2001). A formative measurement model is appropriate here, because the levels of centralization, formalization, and cross-functionality do

Table 2
Share of instances where a process was deemed relevant, per strategy.

Purchasing processes	Cost strategy	Innovation strategy
Supply market analysis	95.7%	94.2%
Spend analysis	93.7%	92.9%
Sourcing strategy	94.9%	96.8%
Supplier selection and contracting	99.6%	98.1%
Supplier development	91.3%	94.8%
Management of the order cycle	85.8%	82.6%
Supplier involvement into new product development	72.3%	77.4%
Supplier involvement in order fulfilment	73.9%	77.4%
Supplier evaluation	96.0%	98.1%

not necessarily correlate across the nine purchasing processes. The total level of centralization in a purchase category is composed of different levels of centralization/decentralization in different purchasing processes. The same holds true for the other purchasing structure variables as well as for purchasing proficiency.

Before calculating overall purchasing structure and proficiency levels, we also checked the descriptives at the level of purchasing processes (Appendix B, Table B1). The results show that purchasing structure and purchasing proficiency variables score quite similarly across purchasing processes for a given strategy. There are, however, also some differences, which is consistent with operationalizing structure and proficiency constructs as formative measures.

In line with previous studies examining (firm) performance, we included country, industry, and firm size as control variables (Huang et al., 2008; Wagner et al., 2012). We used responses from Italy as the baseline, and included nine dummy variables for the remaining countries. We grouped industry as manufacturing and service firms, and had one dummy variable for the industry where manufacturing firms were used as the baseline. We grouped firm size as SMEs (FTE < 250), large firms (250 < FTE < 1000), and very large firms (FTE > 1000), and had two dummy variables where SMEs were used as the baseline. Finally, we also included purchase category experience as a control variable, as the literature suggests that purchasing maturity is highly related to purchasing performance (Schiele, 2007). We measured purchase category experience with a single item (experience of purchasing with this supply market), adopted from McQuiston (1989).

3.3. Measurement equivalence

The effect of cognitive or socio-cultural differences in response to a survey tool can seriously distort the results (Mullen, 1995). Therefore, we first checked for measurement equivalence across countries before pooling the data (Malhotra and Sharma, 2008). Multi-group confirmatory factor analysis (MGCFA) is arguably the most powerful approach for measurement equivalence tests (Steenkamp and Baumgartner, 1998); however, it requires large sample sizes per group. Instead of MGCFA, we used generalizability theory which has been suggested as the next best alternative for measurement equivalence testing when sub-sample sizes are smaller (Malhotra and Sharma, 2008; Sharma and Weathers, 2003).

Generalizability theory provides estimates of five types of variance: (i) item (low values indicate a well-developed scale, and very low values indicate item redundancy); (ii) groups, or in this study, countries (high values indicate differences in item scores across countries, thereby suggesting measurement inequivalence); (iii) subjects within countries (high values indicate that responses to the items vary across subjects, which is desirable and increases generalizability); (iv) group and item interaction (low values indicate that patterns of responses are the same across countries, which increases generalizability), and (v) error and other interactions (low variation enhances generalizability). The final source of variation stems from errors and interactions of different sources of variance (E).

We used the SPSS syntax provided by Mushquash and O'Connor (2006) to calculate the variances mentioned above and the generalizability coefficients (GCs) for our reflective constructs. The results reported in Table 3 suggest that country, and country and item interaction constitute a very small portion of the variance, and the GCs are at acceptable levels (Pagell et al., 2013). Thus, there is no indication of measurement inequivalence, and from this we conclude that the data can be pooled.

3.4. Construct validation

We assessed the validity of the formative constructs – *centralization, formalization, cross-functionality, and purchasing proficiency* – by ensuring that the measurement items conceptually capture a substantial part of the domain (Diamantopoulos and Winklhofer, 2001; Rossiter, 2002), and by examining the multi-collinearity among the measurement items (Diamantopoulos and Winklhofer, 2001; MacKenzie et al., 2011).

In order to not miss any relevant purchasing process where the purchasing structure might be different, we developed scales based on an exhaustive set of purchasing processes including not only the traditional tactical and operational processes, but also more strategic purchasing processes. We measured multi-collinearity among measurement items by calculating the variance inflation factors (VIF). The VIF values for our formative constructs were between: 1.94–4.11 (formalization), 1.50–2.32 (cross-functionality), 1.45–2.72 (purchasing proficiency), and 4.99–8.26 (centralization), satisfying the most commonly accepted ceiling value of 10 (Diamantopoulos and Winklhofer, 2001; MacKenzie et al., 2011). As it is highly important in a formative measure to ensure that all dimensions are sufficiently covered (Diamantopoulos and Winklhofer, 2001; MacKenzie et al., 2011), we did not delete any items from the centralization construct solely on the basis of relatively higher VIF values.

We assessed the reliability of the reflective constructs – *cost strategy, innovation strategy, cost performance, and innovation performance* – by calculating Cronbach's α values and conducting a CFA using the R software (version 2.5.2). The CFA results reported in Table 4 indicate an acceptable model fit ($\chi 2 = 248.27$, $\chi 2/df = 3.50$, goodness-of-fit index = 0.891, RMSEA = 0.097, SRMR = 0.059) (Bollen, 1989; Hair et al., 2010; MacCallum et al., 1996). The reliability of each construct was satisfactory with a composite reliability value of at least 0.70 (Fornell and Larcker, 1981; O'Leary-Kelly and Vokurka, 1998). In order to evaluate convergent validity, we checked the standardized factor loadings and AVE values. All standardized factor loadings were significant at $p < 0.01$, and loadings for all but two items (INNOS3 and INNOS4) were above the suggested threshold value of 0.6 (Bagozzi et al., 1991), thus indicating high construct reliability. Considering the conceptual definition of the respective construct and the sufficiently high Cronbach's α value (0.76), we decided to retain those two items. All constructs had AVE values higher than 0.5 (Fornell and Larcker, 1981), except innovation performance which had an AVE of 0.42 that, although low, is still considered to be within acceptable limits (Handley and Benton, 2012). Finally, we assessed discriminant validity by examining inter-construct correlations (Table 5). Discriminant validity was achieved since the square root of the AVE of the constructs was higher than their correlations with other constructs (Fornell and Larcker, 1981). Overall, the measurement model exhibits sufficient reliability and validity.

Table 3
Measurement equivalence.

	Number of items	Items	Countries	Subjects within countries	Country and item interaction	Error, interaction terms	GC
Cost strategy	4	14.47%	0.12%	34.08%	1.92%	49.41%	0.73
Innovation strategy	4	4.65%	2.18%	48.82%	0.23%	44.12%	0.82
Cost performance	2	1.89%	0.38%	44.54%	1.33%	51.87%	0.63
Innovation performance	4	5.84%	1.82%	39.35%	0.02%	52.97%	0.76

Table 4
Confirmatory factor analysis.

Constructs	Item	Loading	t Value	AVE	Composite reliability	Cronbach α
Cost strategy	COSTS1	0.622	11.009	0.58	0.84	0.73
	COSTS2	0.737	13.795			
	COSTS3	0.882	14.049			
	COSTS4	0.776	13.256			
Innovation strategy	INNOS1	0.884	17.593	0.82	0.95	0.82
	INNOS2	0.915	17.231			
	INNOS3	0.957	16.112			
	INNOS4	0.862	15.548			
Cost performance	COSTP1	0.772	12.095	0.57	0.73	0.46[a]
	COSTP2	0.744	13.161			
Innovation performance	INNOP1	0.803	19.727	0.42	0.73	0.76
	INNOP2	0.823	19.906			
	INNOP3	0.466	11.345			
	INNOP4	0.483	10.749			

[a] Intra-class correlation instead of Cronbach α is stated as the construct consists of two items.

3.5. Purchasing-strategy structure misfit

In order to measure the strategy-structure (mis)fit, we used profile deviation analysis (Drazin and Van de Ven, 1985; Hult et al., 2007; Venkatraman, 1989). Fit can be examined in several ways such as moderation, mediation, matching, gestalts, profile deviation, and covariation (Venkatraman, 1989). Profile deviation is the preferred method when simultaneous impact of multiple variables on performance is assessed (Baier et al., 2008; Drazin and Van de Ven, 1985). Inherent in profile deviation analysis is the holistic system approach allowing for more effectively examining complex phenomena and closely related variables (Baier et al., 2008; Blome et al., 2014; Hult et al., 2007). In line with this, we argue that a deviation from an ideal purchasing structure consisting of multiple dimensions (centralization, formalization, and cross-functionality) results in a lower purchasing performance. Previous research examining similar phenomena has also extensively relied on this technique (e.g. Baier et al., 2008; Hult et al., 2007; Xu et al., 2006).

We defined the ideal purchasing structures for cost and innovation purchasing strategies building on the structural contingency theory and organizational design literature (Burns and Stalker, 1961; Damanpour, 1991). As discussed in previous sections, when implementing cost strategies, high levels of centralization and formalization, and low levels of cross-functionality are required, and vice versa for innovation strategies. We hypothesized that the ideal scores for the purchasing structure dimensions should be the relevant extreme points of the scales (i.e. for cost strategy the ideal scores are: centralization = 4, formalization = 6, cross-functionality = 1, and for innovation strategy the ideal scores are: centralization = 1, formalization = 1, cross-functionality = 4, see the appendix for scale formats). In order to remove the effects of different scale formats and potential multi-collinearity, we standardized the data first (Baier et al., 2008; Hult et al., 2007). We calculated the purchasing strategy-structure misfit in cost and innovation strategies separately based on the following formula:

$$Misfit_i = \sqrt{(Central_{ideal} - Central_i)^2 + (Formal_{ideal} - Formal_i)^2 + (Crossf_{ideal} - Crossf_i)^2}$$

The deviation score indicates the degree of misfit on a continuum between a total misfit and a perfect fit, where higher values indicate greater misfit. For our hypotheses to be supported, the results should indicate that the deviation from the ideal purchasing structure profile (from this point on referred to as “cost/innovation misfit”) is negatively related to purchasing cost (innovation) performance when implementing a purchasing cost (innovation) strategy (Drazin and Van de Ven, 1985; Venkatraman, 1989).

3.6. Common method bias

We collected our data from single informants using perceptual measures, therefore the threat of common method bias (CMB) needs to be evaluated. First of all, at the survey design stage we took several measures to minimize the effect of CMB (Podsakoff et al., 2003). First, we assured full anonymity for the informants. Second, we improved the credibility of the answers by targeting purchasing managers and above, and by specifically asking informants to answer for a purchase category they are knowledgeable about (Narayanan et al., 2011). Third, we distributed the questions over separate pages in the online questionnaire, which decreases the item priming effects where the positioning of certain questions might suggest the informant an association with other variables (Podsakoff et al., 2003). Finally, to overcome one of the most important source of CMB we varied scale formats and anchors according to what was most appropriate for each question (Klein et al., 2007).

In addition to taking these remedies at the design stage, post-data collection we checked CMB with the single factor approach of Harman (1967) by using exploratory factor analysis (EFA). The EFA results indicated a solution with nine factors that accounted for 68.02% of the total variance, and the first factor accounted for only 22.75% of the variance in the data. We also compared a single-factor model with all-factors model, and the fit indices for the single-factor model was much worse (χ^2 difference = 894.33, $p < 0.001$). Additionally, we tested two different latent variable models – a measurement model with only the measurement items and their respective constructs, and a measurement model including a method factor in addition to the these (Podsakoff et al., 2003). The method factor model exhibited worse fit (CFI by −0.08, NNFI by −0.09), and the common method factor accounted for significantly less than the 25.0% of the total variance (Williams et al., 1989). As a result of these tests, we conclude that CMB does not seem to pose a threat in our study.

3.7. Non-response bias

In order to assess whether there is any threat of non-response bias, we compared early respondents with late respondents under the assumption that late responders are similar to non-respondents (Armstrong and Overton, 1977; Wagner and Kemmerling, 2010). Our online questionnaire tool allows us to know exactly when the respondents completed the questionnaire. Based on this information, we identified early and late respondents by dividing the sample into two. We compared early and late respondents both on our items of interest in this study, and also on some company characteristics. Out of the 51 items from the questionnaire used in our analyses, only five items showed significant differences between early respondents (E) and late respondents (L) (INNOS1 = E: 3.92, L: 3.71; INNOS2 = E: 3.76, L: 3.52;

Table 5
Correlations.

	Mean	SD	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1) Cost strategy	3.79	0.89	1																	
(2) Innovation strategy	3.52	1.02	0.48**	1																
(3) Centralization	2.32[a]	1.14	0.08	0.01	1															
(4) Formalization	3.72	1.03	0.26**	0.30**	0.12**	1														
(5) Cross-functionality	2.47[a]	0.66	0.09	0.23**	0.06	0.22**	1													
(6) Purchasing proficiency	4.30	0.67	0.22**	0.25**	0.16**	0.49**	0.13**	1												
(7) Cost performance	4.59[b]	0.98	0.09	0.02	0.06	0.14**	0.01	0.27**	1											
(8) Innovation performance	4.13[b]	0.73	0.10*	0.07	0.15**	0.21**	0.01	0.29**	0.46**	1										
(9) Category experience	4.64	0.85	0.14**	0.07	0.10*	0.18**	−0.02	0.30**	0.15**	0.16**	1									
(10) Industry	0.39	0.49	−0.09*	−0.06	0.18**	0.02	0.11*	0.05	0.01	0.08	−0.04	1								
(11) Country Netherlands	0.08	0.28	−0.02	−0.04	0.12**	−0.03	0.07	0.00	0.01	−0.01	0.02	−0.04	1							
(12) Country UK	0.14	0.35	−0.08	−0.06	−0.12**	0.04	−0.10*	0.05	−0.02	−0.01	0.00	0.10*	−0.12**	1						
(13) Country Germany	0.09	0.29	0.06	−0.02	0.20**	0.09	0.04	0.10*	0.00	0.09	0.13**	0.03	−0.10*	−0.13**	1					
(14) Country Spain	0.08	0.27	0.08	0.13**	0.08	0.19**	0.00	0.09	0.02	0.05	0.04	−0.02	−0.09	−0.12*	−0.09*	1				
(15) Country Sweden	0.21	0.41	−0.07	−0.13**	−0.23**	−0.13**	−0.09	−0.13**	0.04	−0.14**	−0.10*	−0.21**	−0.15**	−0.21**	−0.16**	−0.15**	1			
(16) Country Finland	0.06	0.24	0.09	−0.02	0.05	0.04	0.07	−0.06	−0.04	−0.08	0.08	−0.05	−0.08	−0.11*	−0.08	−0.08	−0.13**	1		
(17) Country France	0.11	0.31	−0.02	0.05	−0.01	−0.16**	−0.01	−0.08	0.03	0.16**	−0.02	0.07	−0.11*	−0.14**	−0.11*	−0.10*	−0.18**	−0.09*	1	
(18) Country United States	0.09	0.28	−0.03	−0.01	−0.04	−0.06	−0.01	−0.03	−0.04	0.02	−0.21**	0.26**	−0.09*	−0.13**	−0.10*	−0.09	−0.16**	−0.08	−0.11*	1
(19) Country Canada	0.05	0.22	0.06	0.08	−0.02	0.07	0.14**	0.00	−0.11*	−0.06	0.03	−0.04	−0.07	−0.09*	−0.07	−0.07	−0.12*	−0.06	−0.08	−0.07

Significance levels:
* $p < 0.05$.
** $p < 0.01$.
[a] Based on 1–4 scale.
[b] Based on 1–7 scale, all other scales based on 1–6 scale (see Appendix A for further details)

Table 6
Regression results – direct effects.

	Dependent variables			
	Cost performance	Cost performance	Innovation performance	Innovation performance
Independent variables				
Cost misfit		−0.161*		
Innovation misfit				−0.201*
Control variables				
Purchase category experience	0.188**	0.162*	0.250**	0.228*
Industry – service	0.065	0.049	0.006	0.006
Firm size – large	−0.107	−0.117	−0.107	−0.117
Firm size – very large	0.055	0.055	0.01	0.084
Country – Netherlands	0.067	0.080	−0.009	0.009
Country – United Kingdom	0.069	0.095	0.000	−0.009
Country – Germany	0.081	0.065	0.103	0.090
Country – Spain	0.103	0.099	−0.037	−0.066
Country – Sweden	0.208†	0.252*	0.065	0.073
Country – Finland	0.049	0.056	−0.127	−0.127
Country – France	0.146	0.173†	0.205†	0.190†
Country – United States	0.031	0.068	0.056	0.055
Country – Canada	−0.125	−0.099	−0.004	0.005
R^2	0.103	0.124	0.131	0.169
Adj R^2	0.051	0.070	0.048	0.082
R^2 change	0.103*	0.021*	0.131†	0.037*
F	1.995*	2.279**	1.579†	1.955*

Notes: Sample size: Cost model = 240, Innovation model = 155, cases excluded listwise. The effect sizes are reported in standardized ß coefficients.
Significance levels:
* $p < 0.05$.
** $p < 0.01$.
† $p < 0.10$.

CENTR6 = E: 2.13, L: 1.87; CENTR7 = E: 2.28, L: 1.98; COSTP1 = E: 4.86, L: 4.54) . The two groups did not differ significantly in terms of firm size (the number of employees, $p = 0.582$) and the industry distribution was also very similar in both samples (E = manufacturing: 58.6%, services: 39.7%; L = manufacturing 63.4%, services: 36.2%). These results suggest that there is not a major concern for non-response bias, and that we can continue with the OLS regression analyses.

4. Results

In order to test our hypotheses 1 and 2, we performed hierarchical regression analyses for cost and innovation models. Table 6 illustrates the results of these analyses as well as the significant R^2 changes and the significance of the overall models. First, cost performance and innovation performance were regressed on the control variables, and then cost misfit and innovation misfit were entered into their respective models. We checked for possible multi-collinearity by examining the variance inflation factor (VIF) values of independent and control variables. We found that the VIF scores range between 1.108 and 3.501 in the cost model and 1.073 and 2.659 in the innovation model and, which are significantly lower than the suggested threshold score of 10 (Neter et al., 1989), indicating the absence of multi-collinearity.

We tested for heteroscedasticity using the recommended Breusch–Pagan test ($p > 0.05$). There was not an issue of heteroscedasticity in the innovation model (BP = 14.868, df = 14, p = 0.387) whereas in cost model the results were significant (BP = 26.528, df = 14, $p = 0.022$). Thus, we also checked heteroscedasticity-consistent standard error estimates for the cost model as suggested by MacKinnon and White (1985), using the HC3 syntax of Hayes and Cai (2007). The results of this analysis indicated that the significance levels were not substantially different from the original model and the conclusions do not change, thus we proceed with the regression results.

The results show that cost misfit has a negative impact on cost performance ($\beta = -0.161$, $p < 0.05$) and likewise, innovation misfit has a negative impact on innovation performance ($\beta = -0.201$, $p < 0.05$), which means that Hypotheses 1 and 2 are not rejected.

In order to test the mediation hypotheses we adopted the bootstrapping approach proposed by Preacher and Hayes (2004, 2008) and Hayes (2009). Although the Baron and Kenny (1986) procedure is widely adopted, recent guidelines propose that the only condition that needs to be met to establish a mediating effect is the significance of the indirect effect of an independent variable on the dependent variable through the mediator (Zhao et al., 2010). The Sobel (1982) test is one option to test this; however, it assumes that the indirect effect is normally distributed which is unlikely to hold in many cases (Zhao et al., 2010). Compared to the Sobel test, the bootstrapping approach proposed by Preacher and Hayes (2004, 2008) and Hayes (2009) is much more powerful (Malhotra et al., 2014). Recent OM articles about best practices in mediation analysis also suggest that bootstrapping is the preferred method to detect an indirect effect and compute its confidence interval (Malhotra et al., 2014; Rungtusanatham et al., 2014). In bootstrapping, a random sample is drawn from the data set multiple times. In each random sample drawn, direct and indirect effects and their standard errors are estimated, and biased-corrected confidence intervals for each estimated parameter are reported.

On the basis of 5000 random samples, we estimated the direct[1] and indirect effects of cost misfit on cost performance, and innovation misfit on innovation performance. We found that a 95% bootstrapping confidence interval for the indirect effect on cost performance lies between −0.144 and −0.028 (adjusted $R^2 = 0.124$, $p < 0.001$), and between −0.112 and −0.032 (adjusted $R^2 = 0.122$, $p < 0.01$) for the indirect effect on innovation performance. Because zero is not in the 95% confidence intervals in either model, the results confirm that the indirect effects we report above are indeed significantly different from zero ($p < 0.05$, two-tailed tests) and that our hypotheses about mediated relationships are not rejected.

As a robustness check, we did a split at the median for both strategies and took out cases which score lower than the median (as

[1] Following the suggestion of Rungtusanatham et al. (2014) we avoid distinguishing between full and partial mediation as statistically a complete mediation can never be truly tested, and we only comment on the indirect effects.

these cases might also illustrate a lack of strategic orientation), and ran the analyses again. The results show that cost misfit has a negative impact on cost performance ($\beta = -0.129$, $p < 0.10$), and innovation misfit has a negative impact on innovation performance ($\beta = -0.180$, $p < 0.05$), supporting the direct effects. We also found that a 95% bootstrapping confidence interval for the indirect effect on cost performance lies between -0.151 and -0.011 (adjusted $R^2 = 0.057$, $p < 0.01$), and between -0.110 and -0.012 (adjusted $R^2 = 0.073$, $p < 0.01$) for the indirect effect on innovation performance. As another robustness check, we took out the top 10% of observations from both models where the difference between cost and innovation scores are the lowest, and ran the analyses again. The results show that cost misfit has a negative impact on cost performance ($\beta = -0.166$, $p < 0.10$), and innovation misfit has a negative impact on innovation performance ($\beta = -0.113$, ns[2]). We also found that a 95% bootstrapping confidence interval for the indirect effect on cost performance lies between -0.162 and -0.010 (adjusted $R^2 = 0.069$, $p < 0.001$), and between -0.113 and -0.004 (adjusted $R^2 = 0.130$, $p < 0.001$) for the indirect effect on innovation performance. In sum, the robustness checks provide further support for our conclusions.

5. Discussion

The aim of this study was to contribute to both theory and practice regarding purchasing organizational design issues by testing the extended contingency framework (strategy-structure-process-performance) at the purchase category level. More specifically, we predicted that a (mis)fit between purchasing strategy and purchasing structure has a (negative) positive impact on purchasing performance, and that this impact is mediated through purchasing proficiency. We conducted cross-disciplinary research by combining organization design, innovation, and purchasing literatures. This is in line with the recent debate about the necessity of conducting cross-disciplinary research in the operations management field as such settings do not only foster the scholarly development of operations management field, but also more clearly represent the multi-faceted decision-making challenges organizations face in real life (Linderman and Chandrasekaran, 2010; Singhal and Singhal, 2012).

In line with hypotheses 1 and 2, we empirically validated that if firms do not adopt an appropriate purchasing structure matching their purchase category strategy, they experience less favourable outcomes. Our results show that while pursuing a cost purchasing strategy, firms are better off when they adopt a purchasing structure characterized by high centralization, high formalization, and low cross-functionality. A deviation from this ideal structure results in lower cost performance. Conversely, while pursuing an innovation purchasing strategy, firms are better off when they adopt a purchasing structure characterized by low centralization, low formalization, and high cross-functionality. Our results show that the higher the purchasing structure deviates from this ideal profile, the lower the innovation performance will be. These findings provide strong support for the notion that organizational design characteristics should enable the chosen strategy (Chandler, 1962; Porter, 1985; Tushman and Nadler, 1978; Wasserman, 2008); not only at the overall purchasing organization level as discussed in previous studies (David et al., 2002), but also at the purchase category level.

5.1. Contributions to theory

One of the key contributions of this study is our unit of analysis. Extant research investigating purchasing organizational design often focuses on departmental level as the unit of analysis (Johnson et al., 2002; Rozemeijer et al., 2003). There is recent evidence suggesting that firms increasingly adopt more complex, hybrid purchasing structures which vary even at the purchase category level (Trautmann et al., 2009). Similarly, it is also acknowledged that firms do not adopt a single, overarching purchasing strategy, and that there is a need for examining purchasing strategies at more micro levels, such as the purchase category (Ateş et al., 2015; Hesping and Schiele, 2015). In line with these, our study contributes to the recent stream of research that investigate purchasing strategies and practices at the purchase category level (Ateş et al., 2015; Hesping and Schiele, 2015; Luzzini et al., 2012).

The second contribution of this study is examining purchasing structure specifically in relation to purchasing strategy. Schneider and Wallenburg (2013) find in their detailed review about purchasing organizational design studies that out of the 99 articles that investigate structure and formalities, only a handful of them examine the link to purchasing strategy. In this study, we empirically illustrate the importance of adopting a holistic view in purchasing organizational design and considering its link to purchasing strategy and purchasing proficiency to achieve superior purchasing performance. Our results illustrate that it is not purchasing structure per se that determines success, but rather its alignment with purchasing strategy.

Finally, a third contribution of our study is illustrating the mechanism of *how* a (mis)fit between purchasing strategy and purchasing structure actually impacts purchasing performance. Studies investigating the fit between strategy and structure usually test only a direct link between fit and performance, and at best conceptually discuss the underlying mechanisms. In this study, we find that purchasing proficiency mediates the relationship between the purchasing strategy-structure misfit and purchasing performance. In other words, a misfit does not directly impact performance, but the incongruence between strategy and structure manifests itself in the form of inefficiencies and lower quality in internal processes, which in the end results in lower performance.

5.2. Implications for practice

Our findings provide useful guidelines for managerial decision-making in the area of purchase category management. Purchase category management is a very common practice among firms, and its importance and adoption are expected to increase even more in the near future (Monczka and Petersen, 2008; Trent, 2004). The significant impact of the congruence between purchasing strategy and purchasing structure on purchasing performance in implementing both cost and innovation category strategies highlights the necessity of giving priority to organizational design issues. Our findings demonstrate that categories managed for cost are best done so via adopting a highly centralized and formalized approach, and without substantial cross-functional collaboration. Categories managed for innovation are best managed via a decentralized and cross-functional approach, without substantial formalization. Thus, although firms might have an overall purchasing structure in place, decision makers should not underestimate the importance of adjusting the way this purchasing structure is enacted to the different purchase category strategies. For instance, even if an organization has the ability to manage processes quite centrally and in a formalized manner, it makes sense to not apply these abilities when the category objectives are predominantly related to innovation. Being able as buying organization to maximally leverage the performance of purchase categories thus requires two things. First, it requires an organizational structure or capability that spans the entire spectrum, from no to full centralization, from no to full formalization and from no to full cross-functional collaboration. Second, it requires that the buying organization applies an approach to organizing the management processes for each category that is tailored to the objectives of the category.

The additional insights gained by the mediation analysis make managers aware of the impact organizational design problems can have

[2] Due to much lower sample size in the innovation model, the effect size is not significant, however it still indicates a large effect and is in the expected direction.

on the execution of internal processes. A misfit between purchasing strategy and purchasing structure negatively impacts the quality of internal processes in implementing both cost and innovation strategies, which in turn decreases purchasing performance.

To sum up, when faced with unsatisfactory performance outcomes, purchasing managers should not have a one-sided view and only consider how the purchasing processes might be bringing about this negative outcome. As our findings illustrate, what might be causing lower purchasing proficiency in the first place can relate to organizational design problems rather than implementation of the wrong purchasing processes.

5.3. Limitations and suggestions for future research

Evidently, the implications discussed in this research should be interpreted in light of several limitations inherent in this study. First of all, the cross-sectional nature of the data prevents us from making strong statements about causality. Future studies could employ longitudinal designs, which also help uncover the dynamic relationship between strategy and structure. Second, we rely on single informants. Although our analyses indicate that there is not an obvious threat of common method bias, future studies would benefit from incorporating multiple informants and data sources to triangulate data. Third, we relied on perceptual measures to evaluate purchase category performance. It is often argued in the literature that using objective data is a better choice when assessing performance, especially when relying on single-informants (Ketokivi and Schroeder, 2004). However, our unit of analysis at the purchase category level prevents us from defining purchasing performance measures that are consistent and available across firms and across purchase categories, especially in relation to innovation performance. Finally, we examined only cost and innovation strategies as the organization strategy-structure literature proposes ideal structures only for these two strategies. Future studies might extend our findings by focusing on other competitive priorities such as efficiency, delivery and flexibility, and examine them both individually and as a combination of several competitive priorities in relation to purchasing structure.

An interesting avenue for research is investigating multiple purchase categories from the same organization to discover the variety in purchasing structures. Another avenue for research is examining purchasing proficiency in each purchasing process in relation to purchasing strategy and purchasing structure; e.g. does cost misfit impact spend analysis proficiency differently than supplier development proficiency? Finally, future studies can also focus on identifying other mediators between purchasing strategy-structure misfit and purchasing performance.

Notwithstanding these limitations, we hope that this study with its attention to multiple dimensions of organizational structure in purchasing and its choice of purchase categories as the unit of analysis will help inspire further research on the impact of strategy-structure (mis)fit on performance and the underlying mechanisms.

Appendix A. Questionnaire items

A.1. Purchase category strategy

Please indicate to what extent management has emphasized the following priorities for the chosen category over the past 2 years (1 = not at all, 6 = completely):

Items:

COSTS1. Reducing product/service unit prices
COSTS2. Reducing total cost of ownership of purchased inputs
COSTS3. Reducing (internal) purchasing process cost (e.g. e-procurement)
COSTS4. Reducing asset utilization for this category (e.g. headcount, inventory)
INNOS1. Improving time-to-market with suppliers
INNOS2. Improving introduction rates of new/improved products and services
INNOS3. Improving conformance quality of purchased inputs
INNOS4. Improving specifications and functionality of purchased inputs

A.2. Purchasing function structure and purchasing proficiency

Please first indicate which processes below the purchasing department is involved in for the chosen purchase category (1 = Purchasing is involved, 2 = Purchasing is not involved, 3 = Not executed for this category):

1. Supply market analysis *(The process of analysing the supply market for the chosen category* -e.g. *searching for new suppliers, supply market structure, technological developments)*
2. Spend analysis *(The process of analysing the purchasing spend of the chosen category)*
3. Sourcing strategy *(The process of formulating a sourcing strategy for the chosen category*
4. Supplier selection and contracting *(The process of sending out request for quotations, tendering/negotiating, and selecting suppliers for the chosen category)*
5. Supplier development *(The process of assisting suppliers in quality and cost improvement programs for the chosen category)*
6. Management of the order cycle *(The process of processing purchase orders for the chosen category, checking order status, and expediting later orders and rush orders)*
7. Supplier involvement into new product development *(The process of managing the involvement of suppliers in the development of new products/ services/processes/ technologies for the chosen category)*
8. Supplier integration in order fulfilment *(The process of integrating suppliers for the chosen category in operations* – e.g. *joint production or inventory planning) and/or in the order fulfilment process)*
9. Supplier evaluation *(The process of measuring supplier performance for the chosen category and the overall relation, and evaluating this performance against performance targets or benchmarks)*

** Informants were first asked to indicate which of the nine purchasing processes stated above are relevant for that particular purchase category, and then indicate the level of centralization, formalization, cross-functionality, and purchasing proficiency in each purchasing process.*

A.2.1. Centralization

Please indicate the level of centralization (i.e. the organizational level that is in charge of the process) for the chosen category for the purchasing processes stated above (1 = Executed locally without corporate involvement, 2 = Corporate provides voluntary templates for local execution, 3 = Corporate provides mandatory templates for local execution, and 4 = Executed at the corporate centre):

Items: *(CENTR1-CENTR9)*

A.2.2. Formalization

Please indicate the level of formalization (i.e. how much the process is guided by written rules and procedures) for the chose category for the purchasing processes stated above (1 = Extremely low, 6 = Extremely high):

Items: *(FORML1-FORML9)*

A.2.3. Cross-functionality (reverse-coded)

Please indicate for the chosen category whether the decision making in the purchasing processes stated above was done in a cross-functional way (i.e. more than one function is involved) or by one function only (1 = Always cross-functional, 2 = Mostly cross-functional, 3 = Mostly performed by

Table B1
Descriptives – purchasing structure and proficiency across strategies.

		Cost strategy			Innovation strategy		
		Freq.	**Mean**	**Std.dev**	**Freq.**	**Mean**	**Std.dev**
Centralization[a]	1. Supply market analysis	95.7%	2.53	1.27	94.2%	2.37	1.24
	2. Spend analysis	93.7%	2.48	1.27	92.9%	2.40	1.22
	3. Sourcing strategy	94.9%	2.59	1.28	96.8%	2.39	1.25
	4. Supplier selection and contracting	99.6%	2.52*	1.25	98.1%	2.24*	1.19
	5. Supplier development	91.3%	2.34	1.25	94.8%	2.16	1.18
	6. Management of the order cycle	85.8%	1.98	1.22	82.6%	2.00	1.21
	7. Supplier involvement into new product development	72.3%	2.10	1.27	77.4%	2.14	1.20
	8. Supplier integration in order fulfilment	73.9%	2.00	1.23	77.4%	2.07	1.19
	9. Supplier evaluation	96.0%	2.40†	1.25	98.1%	2.16†	1.17
Formalization[b]	1. Supply market analysis	95.7%	3.52*	1.29	94.2%	3.27*	1.23
	2. Spend analysis	93.7%	3.87	1.35	92.9%	3.69	1.30
	3. Sourcing strategy	94.9%	3.93*	1.32	96.8%	3.67*	1.28
	4. Supplier selection and contracting	99.6%	4.18	1.25	98.1%	4.01	1.19
	5. Supplier development	91.3%	3.68*	1.22	94.8%	3.41*	1.11
	6. Management of the order cycle	85.8%	3.99	1.22	82.6%	3.86	1.34
	7. Supplier involvement into new product development	72.3%	3.56**	1.35	77.4%	3.17**	1.22
	8. Supplier integration in order fulfilment	73.9%	3.60	1.27	77.4%	3.50	1.27
	9. Supplier evaluation	96.0%	4.12	1.30	98.1%	4.02	1.16
Cross- functionality[a]	1. Supply market analysis	95.7%	2.44*	0.92	94.2%	2.65*	0.92
	2. Spend analysis	93.7%	2.49*	0.95	92.9%	2.73*	0.96
	3. Sourcing strategy	94.9%	2.35**	0.97	96.8%	2.62**	0.95
	4. Supplier selection and contracting	99.6%	2.45	0.95	98.1%	2.54	0.94
	5. Supplier development	91.3%	2.32**	0.87	94.8%	2.56**	0.91
	6. Management of the order cycle	85.8%	2.88	0.89	82.6%	2.94	0.91
	7. Supplier involvement into new product development	72.3%	2.09*	0.80	77.4%	2.28*	0.89
	8. Supplier integration in order fulfilment	73.9%	2.64	0.99	77.4%	2.71	0.87
	9. Supplier evaluation	96.0%	2.33	0.98	98.1%	2.41	0.98
Purchasing proficiency[b]	1. Supply market analysis	95.7%	4.26	0.95	94.2%	4.33	0.85
	2. Spend analysis	93.7%	4.56	0.90	92.9%	4.50	0.84
	3. Sourcing strategy	94.9%	4.50	0.97	96.8%	4.50	0.83
	4. Supplier selection and contracting	99.6%	4.62	0.79	98.1%	4.67	0.72
	5. Supplier development	91.3%	4.03*	0.98	94.8%	4.26*	0.87
	6. Management of the order cycle	85.8%	4.20*	1.01	82.6%	4.41*	0.91
	7. Supplier involvement into new product development	72.3%	3.87**	0.98	77.4%	4.21**	0.99
	8. Supplier integration in order fulfilment	73.9%	3.95	1.01	77.4%	4.10	0.98
	9. Supplier evaluation	96.0%	4.22	0.94	98.1%	4.35	0.91

Significance levels for mean differences:

Note that frequencies of purchasing processes are identical across the three purchasing structure constructs and the purchasing proficiency construct, as informants first indicated which processes are relevant for the chosen purchase category, and then indicated the levels of purchasing structure and proficiency for each of the relevant purchasing processes. Processes that were not deemed relevant were not presented to the informant for scoring in our on-line questionnaire.

* $p < 0.05$.

** $p < 0.01$.

† $p < 0.10$.

[a] Based on 1–4 scale (see Appendix A).

[b] Based on 1–6 scale (see Appendix A).

one-function, and 4 = Always performed by one function):

Items: *(CROSS1-CROSS9)*

A.2.4. Purchasing proficiency

Please indicate the level of proficiency of the purchasing process stated above (i.e. the level of quality in executing each process) for the chosen category (1 = Extremely low, 6 = Extremely high):

Items: *(PROFC1-PROFC9)*

A.3. Purchase category performance

Please consider current category performance – compared to management targets – for the following objectives (1 = Much worse than target, 7 = Much better than target):

Items:

COSTP1. The purchasing price
COSTP2. The cost of managing the procurement process
INNOP1. The supplier time-to-market for new or improved products/services
INNOP2. The level of innovation in products/services from suppliers
INNOP3. The level of supplier conformance to specifications
INNOP4. The level of supplier product/service quality

A.4. Purchase category experience

Item: EXPER: Please indicate the level of experience of your purchasing function with this supply market (1 = Extremely low, 6 = Extremely high).

Appendix B

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